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ABSTRACT

This paper outlines progress of the European Commission (EC) supported Telematics for Teacher Training (T3) project in the development and dissemination of a European Core Curriculum for Information and Communications Technology (ICT) in Teacher Training. National and European governments have recognized the importance of training teachers in the use of information and communication technologies, hence there is a recognized need for such a curriculum across Europe. The paper outlines the aim of the T3 project which is to work with teacher trainers across Europe to support them using ICT in order to enhance their own professional development and the learning of their student teachers. The paper concludes by describing the work of developing a European core curriculum in teacher training. The final project of the Core Curriculum policy is presented. (Author/AEF)

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The Research and Development of an International Core Curriculum for Information and Communications Technology in Teacher Training

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Abstract: This paper outlines progress of the EC supported Telematics for Teacher Training (T3) project in the development and dissemination of a European Core Curriculum for Information and Communications Technology in Teacher Training. National and European governments have recognised the importance of training teachers in the use of information and communication technologies, hence there is a recognised need for such a curriculum across Europe. The paper outlines the aim of the T3 project which is to work with teacher trainers across Europe to support them using ICT in order to enhance their own professional development and the learning of their student teachers. The paper finishes by describing the work in to develop a European core curriculum in teacher training. The final product of the Core Curriculum policy document is presented.

The Need

There is widespread acknowledgement that telematics or Information and Communication Technologies (ICT) can be used to enhance learning and teaching. Many countries around the world are taking action to ensure that their educational systems are updated to permit equality of access and to ensure that the key ICT skills are developed in schools and other educational institutions. The central tenet of the European Information Technology policy is to provide equal access for all, irrespective of where they live in the Community, to the highest possible standard and widest possible range of education and training. It has become abundantly clear that the training of teachers in ICT skills and appropriate pedagogical approaches is essential. "Preparing teachers is perceived as the main critical success factor in deploying ICT in education" (Weets, 1997). Individual countries also feel this as an urgent need. For example the UK Government published its consultation paper 'Connecting the Learning Society' (DfEE, 1997). This outlined UK Government plans to create a National Grid for Learning. The grid will allow schools to link to each other and also to all other learning institutions such as libraries, universities and museums. It will also build content and processes that will make these networks come alive. The document states that a vital strategy within the Grid will be the development of the skills of teachers and librarians. In the United States of America the Panel on Educational Technology has submitted a report of its recommendations to the Government (Shaw, 1997). Two are of particular significance to the work described in this paper: 'Give special attention to professional development' and 'Initiate a major program of experimental research'.

The European Commission's (EC) Framework IV research programme (European Commission, 1994) also noted the need to identify and disseminate good practice and to establish a core curriculum for telematics in teacher training. It recognised a need to establish a shared vision of a curriculum for teachers undergoing training.

The examples as quoted above show the recognised need for a Core Curriculum document, and it is accepted that such a document would be of value both to policy makers and to those with responsibilities for course planning. However, there have been few attempts to undertake this task in the USA, the UK, or other European countries. Four examples of work in this field are reviewed later in this paper.

Three projects were part funded within the EC Telematics Applications Programme to develop ICT in teacher training. This paper draws on the work of the project with the same title 'Telematics for Teacher Training' (T3) which contains a work package specifically to develop and disseminate a European core

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curriculum for ICT in teacher training. This work package draws on the outcomes of a needs analysis undertaken within T3 in 1996. This identified the valuable roles that multimedia telecommunications can play in European Teacher Education (Davis, 1997).

The T3 Project

The T3 project started in 1996 and continued until the end of 1998. It is persuading teachers, via teacher trainers, to adopt ICT in order to enhance their own and their students' learning. In this way, it is planned that European teachers will equip tomorrow's employees and customers with the competence to use tele-training and ICT within their work.

The T3 project is playing a key role in the process of extending understanding and awareness of the benefits of global communications. The project is creating courses, resources and developing professional networking for the training of teacher trainers. These teacher trainers then train teachers who themselves teach young people. So there is a multiplier effect; the project title would suggest a cubing effect T^3, though mathematically this is a gross underestimate. Probably the most important long-term impact of the T3 project is this 'multiplier effect'.

Specifically, the goal of T3 is to encourage teachers to adopt use of ICT as part of their daily work. Different work packages within the project focus on the curriculum areas of mathematics, languages, science and technology. In addition to this there is one which focuses on teacher educators, one for primary teachers and one for library staff. Partners are located in eight different European countries. The resources and courses are based on the use of case studies and are developed to be exemplars of good practice.

This distillation and modelling of best practice in the use of ICT for teacher education has been undertaken across primary and secondary education. Best practice using the Internet and video conferencing over ISDN is being infused into both 'face to face' and distance learning courses with teacher trainers. By the end of 1998 accredited modules in effective use of ICT for teaching and learning have been delivered 'at a distance' through use of communications technologies.

Over 5,000 students and practising teachers were supported in their adoption of ICT for their studies and its use in schools. This has established a community for learning and professional development. A course has also been developed for library staff working with teachers. Through a linked network of Web servers, the T3Centrum provides resources, information and opportunities for team teaching and collaborative development across Europe at http://telematics.ex.ac.uk/T3

A Core Curriculum for ICT?

The core curriculum for ICT in teacher training is envisioned as a policy document for use at many levels. It will concentrate on the overlap between Information Technology and Communication Technologies, such as use of the WWW, Email, computer conferencing, video conferencing etc., rather than taking the whole range of IT applications in education. It is made available to the EC and national governments to inform strategic thinking. Institutions including schools and teacher training organisations will be able to use it to inform cross-curricular planning and the organisation of resources. Teachers and their associations will be able to plan their members access to both ICT itself, key skills for ICT and ways in which to deploy it in education and for their own professional development. Assessment and accreditation bodies will also be encouraged to incorporate ICT into their frameworks. The creation of a core curriculum for teacher training could be a significant contribution to improved communication about the needs of teachers and of teacher education across Europe and more widely.

This vision of an appropriate version for a core curriculum has been informed by previous attempts to create similar policy documents for use by teachers and policy makers. We will now briefly review them.

In 1990 in the USA the International Society for Technology in Education (ISTE) drew up a policy document (Handler & Strudler, 1997) to describe the competencies and contexts that the USA national association felt reflected the professional needs of teachers in relation to ICT. This was a lengthy document with many statements and referenced the guidelines for the United States National Council for the Accreditation of Teachers.

The ISTE document appears to have been relatively under used as shown by the report USA Congress Office of Technology (Fulton, 1996) into IT in teacher education, which identified significant and urgent requirements to develop ICT teacher education in the USA.

In 1992 three bodies came together in the UK to create a framework for competencies in IT in initial teacher education: The Association for IT in Teacher Education (ITTE), the National Association of Advisers in Computer Education (NAACE) and The National Council of Educational Technology (NCET). The result was a holistic framework (ITTE, NAACE & NCET, 1992) which acknowledged that ICT skills could not be practised independently of their context, (see *Figure 1*). The document was widely disseminated in the UK. Its size, a folded sheet of A3, i.e. only 4 sides of A4 paper and its layout, made it easy to assimilate. It permitted those responsible for ICT to disseminate it within their institutions and to encourage a debate. It pr
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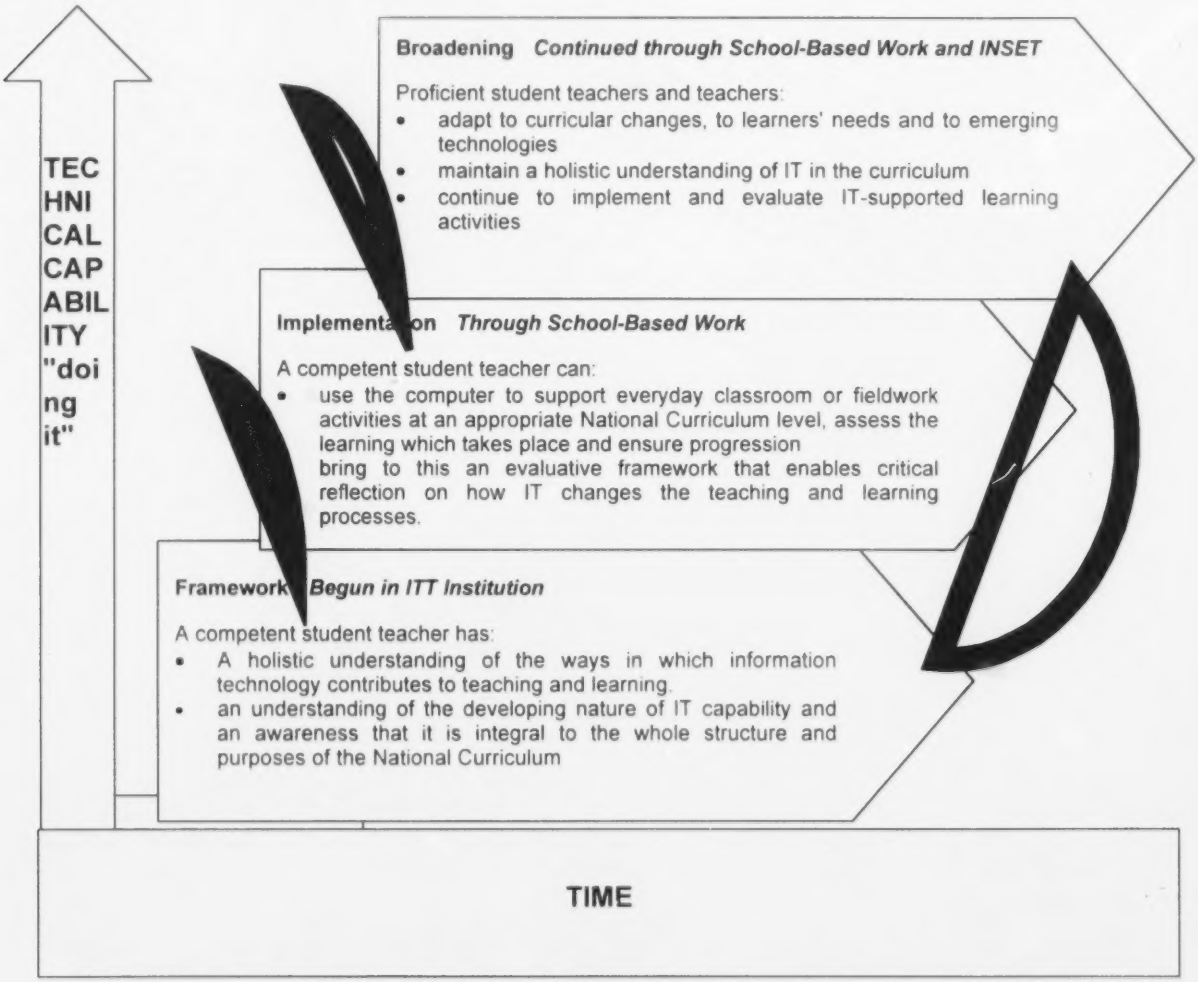
TECHNICAL CAPABILITY "doing it"
Broadening Continued through School-Based Work and INSET
Proficient student teachers and teachers:
• adapt to curricular changes, to learners' needs and to emerging technologies
• maintain a holistic understanding of IT in the curriculum
• continue to implement and evaluate IT-supported learning activities
Implementation Through School-Based Work
A competent student teacher can:
• use the computer to support everyday classroom or fieldwork activities at an appropriate National Curriculum level, assess the learning which takes place and ensure progression
bring to this an evaluative framework that enables critical reflection on how IT changes the teaching and learning processes.
Framework Begun in ITT Institution
A competent student teacher has:
• A holistic understanding of the ways in which information technology contributes to teaching and learning.
• an understanding of the developing nature of IT capability and an awareness that it is integral to the whole structure and purposes of the National Curriculum
TIME

Figure 1: Competencies in Information Technology in Initial Teacher Education (From ITTE NAACE & NCET, 1992)

Since then the framework has been further developed by NCET (National Council for Educational Technology, 1995) into a document for practising teachers which provides both the structure of a curriculum and strategies for ways in which it can be developed by individuals and schools. It remained the same length however, and was also widely disseminated and used. It is now in need of updating, particularly in relation to the recent developments of communications technologies and wider access to ICT in schools and for professional development.

During the autumn of 1997 a new approach was adopted by the UK Teacher Training Agency in the form of an Initial Teacher Training National Curriculum: The use of Information and Communications Technology in subject teaching (Teacher Training Agency, 1998). This document is detailed and lengthy and provides statements of competence for student teachers in the context of the subject and age phase for which the student is training to teach. It has two main sections entitled: 'Effective teaching and assessment methods' and 'Trainees knowledge and understanding of, and competence in, information and communications technology'. For example there is a requirement (17b) that trainees must demonstrate how reference sources such as the World Wide Web sites on the Internet are relevant to the specialist subject and phase for which they are training. This included how to search these sources for reference material and how to incorporate their use into teaching. Another statement stipulated that trainees must appreciate how ICT can be used to gain access to expertise outside the classroom, the school and even the local community through communications with expert (14b iv).

There are a number of other relevant documents we have studied, including The European Computer Driving Licence (ECDL). This is a syllabus designed to be of relevance to the whole community, not specifically teachers or those in education. It covers the key concepts of computing, its practical applications and their use in the workplace and society in general. This document was of interest because of its cross European nature. It differs from the one proposed in this paper in a number of ways, in particular the fact that the target audience of the proposed Core Curriculum is teachers, and therefore the focus on applications of communications technologies in the context of teaching. Also the Core Curriculum is, as its name suggests, is to be a curriculum, rather than a syllabus.

Developing a European Core Curriculum for ICT in Teacher Training

In order to develop a Core Curriculum for ICT in Teacher Training for Europe, we have drawn together collective expertise from within and outside the T3 project. The process has three main stages:

1. Information gathering (on-line questionnaire)
2. Workshop in May 1998
3. Validation and further refinement

A draft of a European core curriculum for ICT in teacher training was produced. It was made available on the WWW with a review of relevant literature, to inform the debate and an on-line questionnaire to encourage a wide range of people from across Europe to collaborate in the process. The core curriculum materials on the WWW permit links to be made to other on-line materials including those within the T3Centrum (the WWW site of the T3 project) itself. For example, the University of Oulu in Finland has led the creation of flexible learning materials which introduces ICT to teachers. These can be used as a reference source for those wishing to uncover detailed technical knowledge. The project's T3Centrum Web Site also contains many other useful items, including teaching resources, the structure of which implies their skills and contexts for deployment.

In May, these materials were transformed into briefing documents for an international workshop in Portugal, which included invited European policy makers, commercial organisations, experts and others involved in the delivery of teacher training with ICT. This workshop resulted in a new version for wider European consultation, first on-line in the public area of the T3Centrum and then presented at the Teleteaching conference sponsored by the International Federation of Information Processing in September 1998. The final version is now made available to teacher educators, policy makers and teachers across Europe.

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The T3 Core Curriculum - Core Curriculum Framework for Telematics for Teacher Training

Core Curriculum's Purpose

This framework has been designed to assist policy-makers, course developers, teacher trainers and other professionals who are considering the use of ICT in teacher training. It is embedded into national and local infrastructure, culture and context, providing a framework upon which detailed curricula can be built. It also provides a durable framework with which these curricula can be kept up to date as new developments are forged in ICT and education. The production of a core Curriculum for Telematics for Teacher Training was an objective within the EU Framework IV research agenda.

The holistic framework is shown in Figure 2. Its three themes of Networking eight collaborative considerations, pedagogical considerations, and technological considerations are bound together with the management of change, globalisation. The three themes are also described in more detail in the statements below:

Pedagogical Considerations:

- an understanding of the opportunities of the uses of ICT for learning and teaching in the curriculum context;
- an understanding of the implications of the uses of ICT for learning and teaching in the curriculum context;
- the planning and implementation of learning and teaching in open and flexible learning environments; the management of learning and teaching in open and flexible learning environments;
- the evaluation of learning and teaching in open and flexible learning environments.

Networking & Collaboration Considerations:

- a critical understanding of the added value of learning networks and collaboration within and between countries and communities;
- an ability to participate effectively in open and flexible learning environments as a learner;
- an ability to participate effectively in open and flexible learning environments as a tutor;
- an ability to create learning networks that bring added value to the professional development of teachers;
- widening access and providing learning opportunities to all members of learning communities, including those with special needs;
- a willingness to contribute to the global learning society, lifelong learning and the local context.

Technical Considerations:

- an ability to use and select from a range of ICT resources as appropriate to enhance personal and professional effectiveness;
- a willingness to update skills and knowledge in the light of new developments to operate in open and flexible learning environments.

The T3 Core Curriculum is illustrated within the T3 showcase at: http://telematics.ex.ac.uk/T3/

Conclusions

This European core curriculum for ICT in teacher training has been developed by expert practitioners from over 8 European countries and disseminated to policy makers, teacher trainers and commercial organisations involved in education of training. It provides a valuable framework for moving towards the development of an 'Information society' across Europe. It is recognised that the document, when used in parallel with its supporting reference documents, will also highlight the size of the task ahead. Despite the multiplier effect referred to earlier, this should not be underestimated, and the T3 project team hope to be part of the task force to work on this and implement a core curriculum for ICT in teacher training across Europe. We look towards the Society of IT in Teacher Education to explore the wider value of this framework for other continents. Comments and suggestions are invited.

Acknowledgements

The T3 core curriculum has been developed in close collaboration with many colleagues. We would particularly mention Wim Veen and Dominic Prosser. DG XIII_C of the European Commission under the auspices of the Telematics Applications Programme has supported the production of this paper.

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